leads respectively coupled to one of said plurality of anodes, each of said plurality of leads insulatively coupled to any other said plurality of leads such that each of said plurality of leads has the capability of providing an independent electrical current from a power source to its respective one said plurality of anodes.

Cont A2

33. The anode system recited in claim 32 wherein at least one of said plurality of anodes is a ring-shaped anode.

34. The anode system recited in claim 32 wherein at least one of said plurality of anodes is disposed annularly within at least another of said plurality of anodes.

REMARKS

By virtue of the present amendment, claims 1 through 16 of this application have been replaced by claims 17 through 30. Each of those claims have been copied verbatim from United States Patent No. 6,193,860 (the "860 patent"). Claim 17 corresponds to claim 1 of the '860 patent. Claim 18 corresponds to claim 3 of the '860 patent while claims 19 through 30 correspond to claims 5

through 16 of the '860 patent. Claims 31 through 32 correspond to claims 20 and 21 of the '860 patent while claims 33 and 34 correspond to claims 23 and 24 of the '860 patent.

There can be no doubt that the specification and drawings of the present application support the claims copied from the '860 patent. To facilitate the Examiner's confirmation of that fact, applicants submit herewith in the following table; a comparison between each of the limitations of the copied claims, the specification and drawings showing that the claims copied are indeed supported.

'860 Patent Copied Claims	Disclosure Of The Above Application
17. A system for electroplating a layer of material on a semiconductor wafer, said system comprising:	The present application disclosing "electroplating apparatus" (Specification, p. 2, l. 21) is intended to electroplate a semiconductor wafer (Specification, p. 3, l. 12) for the purposes of depositing "electroplating metal" on the wafer (Specification, p. 2, l. 24).
an electrochemical cell, said electrochemical cell comprising a primary anode, a cathode contact, and a chamber, said primary anode and said cathode contact disposed within said chamber;	The present specification describes an electrochemical cell in the form of an "electroplating reactor" (Specification p. 3, l. 6) in which there is a series of anodes in a "anode array 20" (Specification p.7, l.6), one of which is a primary anode. The cathode contact, the electrical connection between the wafer and power supply to the workpiece is illustrated in Fig. 1a. Thus the wafer serves as a cathode and the electric connection between the power supply and the wafer is the "cathode contact" in Fig. 1a. As illustrated in Fig. 14, the anodes and the cathode contact are disposed within the reactor chamber.

at least one secondary anode, said secondary anode for providing a variable current to said semiconductor wafer;	The specification, as noted, describes (p. 7, 11. 5 et seq.) an anode array, and hence at least one of the anodes in that array constitutes a "secondary anode". The various anodes are operated at different potentials as described in the present specification (p. 8 11. 20 et seq.) describing operating "the anodes segment at different electric potentials" (Specification p. 8, 11. 20-21).

a metallic solution, said metallic solution disposed within said electrochemical cell; and	The present specification describes that the electroplating reactor contains an "electroplating solution" (Specification p. 6, ll. 20, 23, et seq.). Electroplating is described (Specification p. 1), as an operation in which copper is among the metals which can be electrochemically deposited on a workpiece. The specification thus describes the use of an electroplating solution. It is a well understood in the art that electroplating solutions for electroplated deposits are copper salts in aqueous solutions. The present specification thus teaches a "metallic solution". In addition, the specification (p. 1, ll. 16 et seq.) teaches that other metals may be deposited including not only copper but nickel, gold and lead as well.
a power source, said power source coupled to said primary anode, to said at least one said secondary anode and to said cathode contact, said power source capable of producing said variable current by providing varying levels of voltage to said primary anode and to said secondary anode.	The specification describes the power source, as illustrated in Fig. 1a. The power source is described as electrically connected with each of a number of anodes. The specification teaches (p. 8, ll. 24 et seq) that the power supply energizes various anodes segments under "differing electric potentials".

The remaining dependent claims are likewise supported as set forth in the following table:

'860 Patent Copied Claims	Disclosure Of The Above Application
18. The system as recited in claim 1 wherein said at least one secondary anode is a ring shaped anode.	The specification, in particular on page 7, lines 22 et seq., describes anodes which are "ring-like elements".
19. The system as recited in claim 1 wherein said at least one secondary anode is comprised of a first secondary anode and a second secondary anode.	The specification describes (p. 7, ll. 28 et seq.), secondary anodes as including up to 4 anodes segments, thus describing the requirement of claim 19 for first and second secondary anodes. That relationship is also shown in the drawings, including Fig. 1, 3, 5, 7, 10-13 and 14.
20. The system as recited in claim 5 wherein said first secondary anode and said second secondary anode are comprised of a first concentric ring and a second concentric ring.	The specification also describes the first and second anodes as formed of concentric rings. That is described in the present specification where the anode segment are characterized as "ring-like elements" which are arranged for a concentric relationship with each other (Specification p. 7, ll. 23- 24).

21. The system as recited in claim 1 further comprising: a semiconductor wafer, said semiconductor wafer coupled to said cathode contact, said semiconductor wafer acting as a cathode and thereby receiving an electroplated film on its surface.	The present specification and drawings describe a semiconductor which is in electric contact with the cathode contact, thus functioning as a cathode which receives an electroplated film on its surface. That is described in the present specification on page 8, for example, and notably lines 14-27. It is also described in drawings 1a and 14.
22. The system recited in claim 1 wherein said at least one secondary anode is disposed within said chamber of said electrochemical cell.	The present specification describes a "segmented anode array 20", all of which, are disposed within the chamber of an electric cell, as shown in Fig. 1 and 14, as examples.
23. The system recited in claim 1 wherein said metallic solution is a copper solution.	The present specification, in particular page 1, line 16, describes the metal deposit as copper, and thus the specification teaches a metallic solution of copper.
24. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of respect to elapsed time of said electroplating operation.	The present specification teaches that anode segments can be operated not only at different electric potentials but also at different times. Thus the present specification teaches the application of a electrical current as a function of time.

25. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of physical location of application of said variable electrical current to said semiconductor wafer.	The present specification teaches that different potentials are applied to different anodes segments, as illustrated in Fig. 1a. That provides a variable electrical current as a function of physical location of the anode segment relative to the semiconductor wafer. That is described in the specification on page 8, as illustrating operating different segments of the anode arrays at different segments having different physical locations at different electric potentials.
26. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of respect to a voltage that exists at discrete locations on said semiconductor wafer being electroplated.	The present specification teaches (p. 4, l. 20 and p. 8, l. 24) that the various segments of the anodes can be operated at different potentials. Since the location of those segments varies, the voltage varies as a function of discrete locations on the semiconductor wafer being plated.

27. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of variation in a profile of said primary anode and at least said at least one secondary anode used in said electroplating operation.	The specification also teaches that the variable electric current is applied as a function of the profile of a primary and secondary anode as illustrated in Fig. 1a of the present application. Fig. 1a shows that the profile over the various anode segments varies along with the electrical current applied to those various segments. That requires that the electric current operate as a function of a position over the profile of the anode sections.
28. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of an influence of said chamber of said electrochemical cell on a theoretically uniform electric field.	Claim 28 describes varying the electrical current as a function of the influence of the chamber on a theoretically uniform electric field. That is illustrated in the present specification, and principally in Figs 1 and 1a. The chamber itself within which the anode segments are positioned have an influence on the distribution of the electrical field in the same sense that the anode segments are distributed across the field of a theoretically uniform electric field in both Fig. 1 of the present specification and Fig. 2B of the specification of the '860 patent.

29. The system recited in claim 1 wherein said power source provides said variable electrical current as a function of a thickness of said layer of material electroplated onto said semiconductor wafer.	Claim 29 refers to a variable electric current as a function of the thickness of material electroplated on the semiconductor wafer. Since both the semiconductor wafer disclosed in the '860 patent and the semiconductor wafer processed according to the present application is essentially the same, the same relationship must necessarily exist. Hence this limitation is necessarily inherent in the system described in the present application.
30. The system recited in claim 1 wherein said power source provides a lower current value at an outer portion of said semiconductor wafer and wherein said power source provides a higher current value at an inner portion of said semiconductor wafer.	Claim 30 refers to providing higher current values to an inner portion of the semiconductor wafer compared to an outer portion of the wafer. That is, in effect, illustrated in Fig. 1a of this application, disclosing as it does a greater surface area of the anode toward the center of the wafer. Thus the limitation of claim 16 is inherent in the present application.
31. The system recited in claim 1 wherein said power source provides said variable electrical current by providing a variable voltage across said primary anode with respect to said at least one secondary anode.	Claim 31 calls for a variable electrical current provided by a variable voltage across the primary electrode with respect to a secondary electrode. That is illustrated in the present specification and particularly in Fig. 1a showing different potentials to different anode segments.

Claim 32, corresponding to claim 21 of the '860 patent, is also supported verbatim by the present specification. A chart showing the support for claim 32 is set forth below:

'860 Patent Copied Claims	Disclosure Of The Above Application

32. An anode system for performing an electroplating operation, said anode system comprising:	The present specification describe "an anode array 20" (Specification, p. 7, l. 6).
a plurality of anodes, said plurality of anodes for performing an electroplating operation on a part, said plurality of anodes insulatively coupled together, said electroplating operation controlled by providing a variable current on said plurality of anodes via varying levels of voltage; and	The present specification, and specifically page 10 along with Fig. 9 illustrates a plurality of anodes for use in an electroplating operation on a wafer. As show in Fig. 9 and as described on page 10, the anodes are insulatively coupled together at element 141 shown in Fig. 9. The specification describes those elements as "divider elements 141" (p. 10, l. 22). That those divider elements are insulating is described by the present specification, and particularly page 4, referring to positioning of "dielectric elements" between "at least two adjacent cones of the anode segments" (Specification, p. 4, ll. 25 et seq.).
a plurality of leads, each of said plurality of leads respectively coupled to one of said plurality of anodes, each of said plurality of leads insulatively coupled to any other said plurality of leads such that each of said plurality of leads has the capability of providing an independent electrical current from a power source to its respective one said plurality	Fig. 1a and the description thereof illustrate the use of separate electrical leads between the power supply and the anode segments. The specification, and notably page 4, lines 20 et seq. as well as Fig. 1a, illustrates separate leads electrically connecting the power supply with various anode segments to provide variable electrical potentials on those segments.

33. The anode system recited in claim 21 wherein at least one of said plurality of anodes is a ring-shaped anode	The present specification, and particularly page 7, lines 18 et seq., describe the segmented anode array as including ring-shaped anodes thus supporting claim 33.
34. The anode system recited in claim 21 wherein at least one of said plurality of anodes is disposed annularly within at least another of said plurality of anodes.	The present specification, and particularly page 7, describes the anodes as annularly shaped in a concentric relationship with one another. That same relationship is illustrated in a number of the drawings, including Figs. 1, 7, 10, and 11. Thus, claim 34 is likewise supported.

The foregoing demonstrates, beyond any debate, that there is common subject matter between the present application and the '860 patent. And applicants here are, prima facie, first inventors of the common subject matter. Whereas the '860 patent has a filing date of April 1999, the present application, a continuation-in-part of earlier Application Serial No. 113,418, has an effective date of at least July of 1998.

In that regard, applicants bring to the attention of the Examiner the fact that the parent Application Serial No. 113,418, was unintentionally caused to become abandoned. A

petition to revive is pending, and it is anticipated that the petition to revive will be granted forthwith, reinstating the application. Once that occurs co-pendency between this application and the parent application will be established.*

Applicant's suggest that the count of the interference correspond to claim 1 of the '860 patent as follows:

A system for electroplating a layer of material on a semiconductor wafer, said system comprising:

an electrochemical cell, said electrochemical cell comprising a primary anode, a cathode contact, and a chamber, said primary anode and said cathode contact disposed within said chamber;

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* The undersigned attorney for applicants was not involved in the events leading to the abandonment of the parent application. Applicant's attorney understands, however, that the abandonment resulted from an accounting mix-up in which the final fee was to be charged to a deposit account which did not have sufficient funds to permit the fee to be charged. Under those circumstances, there can be no doubt that there was no intent to permit that parent application to become abandoned. Indeed, the record establishes the contrary because there is no debate that an attempt was made to pay the issue fee.

at least one secondary anode, said secondary anode for providing a variable current to said semiconductor wafer;

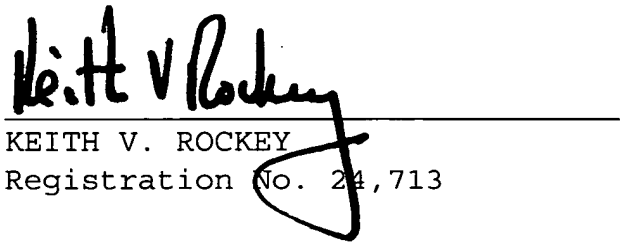
a metallic solution, said metallic solution disposed within said electrochemical cell; and

a power source, said power source coupled to said primary anode, to said at least one said secondary anode and to said cathode contact, said power source capable of producing said variable current by providing varying levels of voltage to said primary anode and to said secondary anode.

That claim is broader than the other independent claim, namely claim 21; claim 21 includes a further limitation that the anode segments be insulatively coupled, a limitation not found in claim 1.

In view of the foregoing, applicants submit that there is common subject matter between the foregoing application and the '860 patent. The Examiner is respectfully requested to declare an interference forthwith.

Respectfully submitted,



KEITH V. ROCKEY
Registration No. 24,713

ROCKEY, MILNAMOW & KATZ, LTD.
Two Prudential Plaza
180 North Stetson Avenue
Suite 4700
Chicago, Illinois 60601
(312) 616-5400
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